

CLAIMS

What is Claimed Is:

- 1 1. A pressure vessel capable of withstanding elevated hydrostatic pressures, and
2 elevated temperature comprising:
3 a tubular casing capable of withstanding extreme hydrostatic pressures having
4 an internal cavity and,
5 an opening in at least one end permitting access to said internal cavity, said
6 internal cavity having a hollow interior and
7 a plug region near said opening, a plug in said plug region,
8 a component in said hollow interior having at least a first lead passing through
9 said plug to exit the pressure vessel, said plug encapsulating said component lead and
10 sealing said opening.
- 1 2. The pressure vessel of claim 1 wherein the plug region is circular in cross
2 section.
- 1 3. The pressure vessel of claim 1 wherein the plug region is circular in cross
2 section, at least a portion of said plug region having a cross section diminishing in
3 diameter with distance from said opening.
- 1 4. The pressure vessel of claim 2 wherein the internal cavity has a circular cross
2 section, the plug region being necked down match the internal cavity circular cross
3 section.
- 1 5. The pressure vessel of claim 1 wherein the lead exiting the opening is at least
2 a first optical fiber having an optical core covered by optical cladding.
- 1 6. The pressure vessel of claim 1 wherein the plug region is circular in cross
2 section, at least a portion of said plug region having a cross section diminishing in
3 diameter with distance from said opening,
4 the lead exiting the opening being at least a first optical fiber having a plastic
5 jacket covering the cladding, a region of the plastic jacket passing through the plug
6 being treated to remove the jacket thereby exposing the cladding, the plug being
7 formed from adhesive encapsulating a portion of the exposed cladding.

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1 7. The pressure vessel of claim 6 wherein the plug region has an irregular surface
2 region for frictionally engaging said plug.

1 8. The pressure vessel of claim 6 wherein the plug region has an irregular surface
2 region for frictionally engaging said plug, the irregular region being threaded.

1 9. The pressure vessel of claim 1 wherein the plug is formed from a ceramic
2 adhesive.

1 10. The pressure vessel of claim 1 wherein the plug is formed from a ceramic
2 adhesive, said plug having an external surface, and wherein said pressure vessel
3 further comprises:

4 a cap, said cap being formed from a polymer material to cover and extend
5 beyond the external surface of said plug thereby forming a fluid barrier over the
6 surface of the plug.

1 11. A pressure vessel capable of withstanding elevated hydrostatic pressures, and
2 elevated temperature comprising:

3 a tubular cylindrical casing capable of withstanding extreme hydrostatic
4 pressures having an internal cavity and,

5 an opening in at least one end permitting access to said internal cavity, said
6 internal cavity having a hollow interior and

7 a cylindrical plug region near said opening,

8 a component in said hollow interior having at least a first lead,

9 a plug in said plug region, the plug having an outer cylindrical surface, the
10 outer cylindrical surface of the plug being force fit into the plug region opening of the
11 cylindrical casing, the plug having a through-hole, for receiving and passing at least
12 the component first lead to a position outside of the pressure vessel, the plug further
13 comprising:

14 a ceramic adhesive plug formed in the through-hole by inserting ceramic
15 adhesive into the through-hole and filling substantially all of the void space within the
16 through-hole not occupied by the lead, the adhesive being allowed to encapsulate the
17 lead passing through the through-hole, thereby sealing the opening.

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1 19. The pressure vessel of claim 18 wherein the through-hole has an inner surface,
2 at least a portion of the inner surface being formed to have an irregular surface region
3 for improved bonding with the ceramic adhesive plug.

4 a cap, said cap being formed from a polymer material to encapsulate a small
5 portion of exposed cladding extending from said external surface, the cap being
6 formed to cover and extend beyond the external surface of said ceramic adhesive plug
7 thereby forming a fluid barrier over the surface of the plug.